CLAIMS

1. A gas permeable substrate, comprising:

a porous metallic plate having a plurality of pores which form openings in an upper surface and/or a lower surface thereof; and

particles filled in the pores,

wherein at least one of the upper surface and the lower surface of the porous metallic plate is substantially smooth.

2. A gas permeable substrate according to claim 1,

wherein not less than 30% of the upper surface and/or the lower surface of the porous metallic plate is covered with the particles.

3. A gas permeable substrate according to claim 1,

wherein the particles are constituted by any one of ceramics and a composite material of ceramics and metal.

4. A gas permeable substrate according to claim 1,

wherein the particles includes a reforming catalyst and an electrode material, and

a stacked structure having not less than two layers is formed within each of the pores.

5. A gas permeable substrate according to claim 4,

wherein the electrode material forms at least a layer selected from a group consisting of an air electrode layer, a fuel electrode layer, and an intermediate layer.

6. A gas permeable substrate according to claim 1,

wherein the porous metallic plate is any one of a sintered metal body, an etching board, and a punching board.

7. A gas permeable substrate according to claim 1,

wherein the porous metallic plate is a collector.

8. A gas permeable substrate according to claim 1,

wherein the porous metallic plate includes at least one type of metal selected from a group consisting of stainless steal, Inconel, nickel, silver, platinum, and copper.

9. A gas permeable substrate according to claim 1,

wherein a thickness of the porous metallic plate is within a range of 0.03 mm to 1 mm.

10. A solid oxide fuel cell, comprising:

a gas permeable substrate having a porous metallic plate which includes a plurality of pores forming openings in an upper surface and/or a lower surface thereof; and particles filled in the pores,

wherein at least one of the upper and lower surfaces of the porous metallic plate are substantially smooth, and

single cells are stacked, each single cell including power generating elements stacked on an upper surface and/or a lower surface of the gas permeable substrate.